

**REMARKS**

**I. Introduction**

Receipt of October 13, 2010 Office Action is acknowledged. In the Action, claims 6-7, 9, 16 and 18 stand rejected under 35 U.S.C. 112, first paragraph, for failing to comply with the written description requirement.

Claims 4 and 17 stand rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over U.S. Patent No. 5,071,613 to Fukami et al.

The Examiner further rejected the following claims for allegedly being obvious:

(1) Claims 6, 16, and 18 over Fukami.

(2) Claims 4-7, 10, 12, and 17-18 over Fukami in view of U.S. Patent No. 5,032,622 to Herrington et al.

(3) Claims 5 and 12 over Fukami in view of U.S. Patent No. 4,251,428 to Recker et al.

(4) Claims 4-7, 10, 12, and 16-18 over WO-0216482 to Joshi (U.S. Patent Pub No. 2003/0176561 to Joshi is also cited) in view of Fukami and Herrington.

(5) Claim 9 over WO-0216482 to Joshi (U.S. Patent Pub No. 2003/0176561 to Joshi is also cited) in view of Fukami and Herrington and U.S. Patent No. 4,738,999 to Blenner.

**II. Status of the Claims**

Claims 4 and 6 are currently amended. Claims 5, 7, 9, 10, 12, 16-18 were previously presented. Claims 1-3, 8, 11, 13-15 and 19-25 are canceled. Upon entry, claims 4-6, 7, 9, 10, 12, 16-18 will be pending for examination.

### III. Rejections under 35 U.S.C. 112

Claims 6-7,9,16, and 18 stand rejected under 35 U.S.C. 112, first paragraph, for allegedly failing to comply with the written description requirement. The Examiner asserts that Example 2, in particular paragraph [0058], of the present specification fails to disclose that the fibrous material is impregnated with the matrix resin “at room temperature”, which is recited in claim 6. Applicants respectfully traverse. For the following reasons Applicants believe that one skilled in the art would understand that Example 2 discloses that the fibrous material is impregnated with the matrix resin at room temperature.

The relevant steps disclosed in paragraph [0058] are as follows: (1) “after evacuation ... at 60° C”, “the base resin and curing agent ... were cooled to *room temperature*” (emphasis added); (2) the base resin and curing agent “were stirred and mixed” to become a “white turbid reaction mixture”; (3) “the white turbid reaction mixture became transparent in about 2 minutes”; (4) “the transparent resin component [i.e., the transparent mixture in step (3)] was poured in the mold; and (5) “they [i.e., the transparent resin component] were cured under conditions of 80° C.x1 hr+120x2 hrs.” After “the cooling to room temperature” in step (1) and before the “cur[ing] under conditions of 80° C” in step (5), there is no mention of any temperature other than the “room temperature.” Steps (1) through (5) in paragraph [0058] essentially describe a process as follows: do something at 60° C (step (1)), cool to room temperature, do something else (steps (2) to (4)), then cure at 80° C (step (5)). Applicants submit that one skilled in the art would understand that steps (2) through (4) are performed at “room temperature” before the cure step at 80° C in step (5). In other words, the “mix[ing]” of step (2) and the “pour[ing]” of step (4) are performed at room temperature. Since the pouring “is considered [by the Examiner] as the impregnation step [in claim 6]” (Office Action, page 2), Applicants submit that paragraph [0058] provides adequate support for the “room temperature” element in claim 6. Applicants therefore respectfully request that the 112 rejection against claims 6-7,9,16, and 18 be withdrawn.

**IV. Rejections under 35 U.S.C. 102**

Claims 4 and 17 stand rejected under 35 U.S.C. 102(b) as allegedly being anticipated by Fukami. Applicants respectfully traverse.

Fukami fails to disclose at least three elements in claims 4 and 17:

(1) Fukami merely discloses bifunctional polyols, trifunctional polyols or a combination of bifunctional and trifunctional polyols, or lower molecular weight polyols (e.g., 1,4 butanediol, which has an average molecular weight of about 90 and is a chain extender), polyether polyols, or polyester polyols or a combination of these polyols (column 2, line 47, to column 3, line 27). Fukami does not disclose the use of *only* bifunctional polyols having an average molecular weight of from 100 to 250 as a polyol component in the polyurethane formation, which is recited in amended claims 4 and 6. Fukami discloses that the polyol can be used with a hydroxyl value within the range of 300-800, but does not deny using polyols having a hydroxyl value of less than 300 (refer to Table 2, Adeca Polyether CM211 having a hydroxyl value of 53, glycerin being trifunctional polyol and having an average molecular weight of about 92).

To expedite prosecution of this application without acquiescing to the Examiner's rejection, Applicants amend claims 4 and 6 to recite "wherein the polyol (i) ~~comprises~~ consists of at least one bifunctional polyol." This amendment further clarifies that claims 4 and 6 are drawn to the use of *only* bifunctional polyols, which is not disclosed or suggested in Fukami.

(2) Nowhere in Fukami is there disclosure that its polyurethane formation has a shape memory characteristic, as recited in claims 4 and 6.

(3) Fukami fails to teach or suggest using a mixture of bifunctional isocyanate and trifunctional isocyanate, which is recited in claims 4 and 6.

Fukami discloses that bifunctional isocyanates (e.g., diphenylmethane diisocyanate), trifunctional isocyanates (e.g., diphenylmethane diisocyanate having a carbodiimide group) or tri- or more functional isocyanates (e.g., polyphenylene polymethylene polyisocyanate) may be used

as an isocyanate component in the polyurethane formation (column 2, lines 19-36). Nowhere in Fukami, however, there is disclosure suggesting a mixture of bifunctional isocyanate and trifunctional isocyanate. Fukami's failure to disclose a mixture of bifunctional isocyanate and trifunctional isocyanate is especially noticeable given its disclosure of a "mixture of [polyether polyols]." Column 2, line 64.

Applicants therefore respectfully request that the rejection against claims 4 and 17 be withdrawn.

**V. Rejections under 35 U.S.C. 103**

The Examiner rejected the following claims for allegedly being obvious. Applicants address each rejection below.

**(1) Claims 6, 16, and 18 over Fukami**

First of all, while acknowledging that Fukami "fails to disclose the potlife [sic]" (Office Action, page 3), the Examiner does not explain how this deficiency is overcome by any teaching or suggestion in Fukami. Therefore, even without considering Applicants' argument below, the Examiner fails to establish a prima facie case of obviousness. Even if the failure to disclose the pot life is somehow overcome, Applicants believe that the obviousness rejection should be withdrawn for the following reasons.

While acknowledging that "there is no teaching [in Fukami] that said impregnating step is done at room temperature" (Office Action, page 3), the Examiner nonetheless alleges that it would have been obvious for one skilled person in the art to arrive at the claimed "room temperature" because the Examiner believes that "it would be obvious to elect a temperature that is below the reaction temperature of the reactants - thereby preventing any unwanted premature reactions." Office Action, page 3-4. Applicants respectfully traverse.

Applicants believe that the Examiner misconstrued the teaching in Fukami regarding how to solve the problem of “thickening reaction occur[ing] immediately after mixing” (Fukami, column 4, line 2, hereafter “impregnation problem”). The Examiner refers to the impregnation problem as “unwanted premature reactions.” Contrary to the Examiner’s suggestion, Fukami does not suggest selecting a temperature below the reaction temperature.” Instead, Fukami discloses that the impregnation problem “can be solved by use of *delayed action catalysts*.” (column 4, line 8-9, emphasis added). Fukami therefore suggest a solution totally different from the “below reaction temperature” solution suggested by the Examiner. Thus, Applicants submit that, based on Fukami’s teaching of using a delayed reaction catalyst, it would *not* be obvious for one skilled person in the art to arrive at the claimed “room temperature” to perform the impregnation step. Applicants therefore respectfully request that the obviousness rejection against claims 6, 16, and 18 be withdrawn.

(2) Claims 4-7, 10, 12, and 17-18 over Fukami in view of Herrington.

The Examiner cited Fukami for this same reason as in (1) above, i.e., that Fukami renders it obvious for one skilled person in the art to arrive at the claimed “room temperature.” Based on the reasons discussed above in (1), Applicants respectfully request that the obviousness rejection against claims 4-7, 10, 12, and 17-18 be withdrawn.

(3) Claims 5 and 12 over Fukami in view of Recker.

Claims 5 and 12 depend from claims 4 and 6, respectively. Applicants’ reason for traversing the Examiner’s rejection against the independent claims 4 and 6 also applies here to claims 5 and 12. Applicants therefore respectfully request that the obviousness rejection against claims 5 and 12 be withdrawn.

(4) Claims 4-7,10,12, and 16-18 over WO-0216482 to Joshi et al. (U.S. Patent Pub No. 2003/0176561 is also cited) in view of Fukami and Herrington.

The Examiner states that Joshi discloses claims 4-7,10,12, and 16-18 with the only exceptions of “fail[ure] to exemplify the use of a lower molecular weight polyol and ... fail[ure] to disclose the Tg [i.e., glass transition temperature] of the final polymer.” Office Action, page 7. Applicants respectfully traverse.

Similar to the deficiency discussed above in section IV (1) regarding Fukami, Joshi does not disclose the use of *only* bifunctional polyols having an average molecular weight of from 100 to 250 as a polyol component in the polyurethane formation, which is recited in amended claims 4 and 6. By amending claims 4 and 6 to recite “consist of at least one bifunctional polyol” instead of “comprises at least one bifunctional polyol”, Applicants further clarifies that amended claims 4 and 6 are drawn to the use of *only* bifunctional polyols, which is not disclosed or suggested in Joshi. Applicants therefore respectfully request that the obviousness rejection against claims 4-7,10,12, and 16-18 be withdrawn.

(5) Claim 9 over WO-0216482 to Joshi et al. (U.S. Patent Pub No. 2003/0176561 is also cited) in view of Fukami, Herrington and Blenner.

Claim 9 depend from claim 6. Applicants’ reason for traversing the Examiner’s rejection against the independent claim 6 also applies here to claims 9. Applicants therefore respectfully request that the obviousness rejection against claim 9 be withdrawn.

Applicants believe that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check

being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing or a credit card payment form being unsigned, providing incorrect information resulting in a rejected credit card transaction, or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicants hereby petition for such extension under 37 C.F.R. § 1.136 and authorize payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

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